

WHAT IS CLAIMED IS:**1. Superabsorbent particles comprising:**

5 (i) about 50% to about 95%, by weight, of a superabsorbent polymer; and
5 (ii) about 5% to about 50%, by weight, of a clay,
said particles prepared by a method comprising the steps of:

10 (a) polymerizing an unneutralized monomer capable of providing a superabsorbent absorbent polymer in the presence of an internal crosslinking monomer to form a superabsorbent polymer hydrogel;

15 (b) comminuting the superabsorbent polymer hydrogel to form superabsorbent polymer hydrogel particles;

(c) admixing a clay with the superabsorbent polymer hydrogel particles to form superabsorbent polymer-clay hydrogel particles;

15 (d) then neutralizing the superabsorbent polymer-clay hydrogel particles by adding a sufficient amount of a neutralizing agent to neutralize the hydrogel particles 50% to 100%, by weight; and

(e) drying the neutralized superabsorbent polymer-clay hydrogel particles of step (d) to provide the superabsorbent particles.

20 2. The particles of claim 1 wherein the method further comprises:

20 (f) surface crosslinking the superabsorbent particles of step (e).

25 3. The particles of one of the claims 1 or 2 wherein the superabsorbent polymer is present in an amount of about 60% to about 90%, by weight, and the clay is present in an amount of about 10% to about 40%, by weight.

30 4. The particles of one of the claims 1 to 3 wherein the superabsorbent polymer comprises a polymerized α,β -unsaturated carboxylic acid, or salt or anhydride thereof.

35 5. The particles of one of the claims 1 to 3 wherein the unneutralized monomer is selected from the group consisting of acrylic acid, methacrylic acid, ethacrylic acid, α -chloroacrylic acid, α -cyanoacrylic acid, β -methylacrylic acid, α -phenylacrylic acid, β -acryloxypropionic acid, sorbic acid, α -chlorosorbic acid, angelic acid, cinnamic acid, p-chlorocinnamic acid, β -stearylacrylic acid, itaconic acid, citraconic acid, mesaconic acid, glutaconic acid, aconitic acid, maleic acid, fumaric acid, tricarboxyethylene, maleic anhydride, vinyl sulfonic acid, allyl sul-

5 fonic acid, vinyl toluene sulfonic acid, styrene sulfonic acid, sulfoethyl acrylate, sulfoethyl methacrylate, sulfopropyl acrylate, sulfopropyl methacrylate, sulfopropyl acrylate, sulfopropyl methacrylate, 2-hydroxy-3-methacryloxypropyl sulfonic acid, 2-acrylamide-2-methylpropane sulfonic acid methacryloxy ethyl phosphate, and mixtures thereof.

10 6. The particles of one of the claims 1 to 3 wherein the superabsorbent polymer is selected from the group consisting of poly(acrylic acid), a hydrolyzed starch-acrylonitrile graft copolymer, a starch-acrylic acid graft copolymer, a saponified vinyl acetate-acrylic ester copolymer, a hydrolyzed acrylonitrile copolymer, a hydrolyzed acrylamide copolymer, an ethylene-maleic anhydride copolymer, an isobutylene-maleic anhydride copolymer, a poly(vinylsulfonic acid), a poly(vinylphosphonic acid), a poly(vinylphosphoric acid), a poly(vinylsulfuric acid), a sulfonated polystyrene, and salts and mixtures thereof.

15 7. The particles of one of the claims 1 to 3 wherein the superabsorbent polymer is selected from the group consisting of a poly(vinylamine), a poly(dialkyl-aminoalkyl (meth)acrylamide), a polyethylenimine, a poly(allylamine), a poly(allylguanidine), a poly(di-methyldiallylammonium hydroxide), a quaternized polystyrene derivative, a guanidine-modified poly-styrene, a quaternized poly((meth)acrylamide) or ester analog, a poly(vinylguanidine), and salts and mixtures thereof.

20 8. The particles of one of the claims 1 to 3 wherein the superabsorbent polymer comprises polyacrylic acid neutralized about 25% to 100%.

25 9. The particles of one of the claims 1 to 8 wherein the clay is a swelling clay selected from the group consisting of montmorillonite, saponite, nontronite, laponite, beidelite, hectorite, saucinite, stevensite, vermiculite, volkonskoite, magadite, medmontite, kenyait, and mixtures thereof.

30 10. The particles of one of the claims 1 to 8 wherein the clay is a nonswelling clay selected from the group consisting of a kaolin mineral, a serpentine mineral, a mica mineral, a chlorite mineral, sepiolite, palygorskite, bauxite, and mixtures thereof.

35 11. The particles of claim 10 wherein the nonswelling clay comprises a kaolinite.

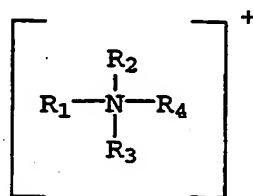
40 12. The particles of one of the claims 1 to 8 wherein the clay is an organophilic clay having an organic component and an inorganic component.

13. The particles of claim 12 wherein the inorganic component of the organophilic clay comprises smectite, bentonite, hectorite, montmorillonite, beidellite, saponite, stevensite, nontronite, illite, attapulgite, a zeolite, fuller's earth, and mixtures thereof.

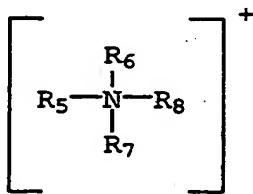
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14. The particles of one of the claims 12 or 13 wherein the inorganic component of the organophilic clay comprises montmorillonite.

10 15. The particles of one of the claims 12 to 14 wherein the organic component of the organophilic clay comprises



15 wherein R_1 is an alkyl group having at least 20 carbon atoms, R_2 is hydrogen, benzyl, or an alkyl group having at least 10 carbon atoms, and R_3 and R_4 , independently, are a lower alkyl group;



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wherein R_5 is CH_3 or $C_6H_5CH_2$, R_6 is $C_6H_5CH_2$, and R_7 and R_8 , independently, are alkyl groups containing long chain alkyl radicals having 14 to 22 carbon atoms; or a mixture thereof.

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16. The particles of one of the claims 12 to 15 wherein the organophilic clay is selected from the group consisting of dimethyl benzyl (hydrogenated tallow) ammonium bentonite, methyl benzyl di(hydrogenated tallow) ammonium bentonite, dimethyl di(hydrogenated tallow) ammonium bentonite, methyl bis(2-hydroxyethyl) octadecyl ammonium bentonite, a bentonite clay treated with an amine containing three to eight carbon atoms, and mixtures thereof.

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17. A method of absorbing an aqueous medium comprising contacting the medium with the superabsorbent particles of one of the claims 1 to 16.
18. The method of claim 17 wherein the aqueous medium contains electrolytes.
19. The method of claim 18 wherein the electrolyte-containing aqueous medium is selected from the group consisting of urine, saline, menses, and blood.
20. An absorbent article comprising the superabsorbent particles of one of the claims 1 to 16.
21. The article of claim 20 wherein the article is a diaper or a catamenial device.
22. A diaper having a core, said core comprising at least 10% by weight of the superabsorbent particles of one of the claims 1 to 16.
23. The diaper of claim 22 wherein the core comprises 20 - 80% by weight of the superabsorbent particles.
24. The diaper of one of the claims 22 or 23 further comprising a topsheet in contact with a first surface of the core, and a backsheet in contact with a second surface of the core, said second core surface opposite from said first core surface.
25. The diaper of claim 24 further comprising an acquisition layer disposed between the topsheet and the core.
26. A method of manufacturing superabsorbent polymer-clay particles comprising the steps of:
 - (a) forming an aqueous monomer mixture comprising (i) at least one monomer, in an unneutralized form, capable of forming a superabsorbent polymer, (ii) an internal crosslinking monomer, and (iii) a polymerization catalyst;
 - (b) polymerizing the monomer in the aqueous mixture to form a superabsorbent polymer hydrogel;
 - (c) comminuting the superabsorbent polymer hydrogel to provide superabsorbent polymer hydrogel particles;
 - (d) admixing a clay with the superabsorbent polymer hydrogel particles to form superabsorbent-clay hydrogel particles;
 - (e) neutralizing the superabsorbent polymer-clay hydrogel particles by adding a base to the superabsorbent polymer-clay hydrogel particles; and

(f) drying the neutralized superabsorbent polymer-clay hydrogel particles for a sufficient time at a sufficient temperature to provide dry superabsorbent polymer-clay particles.

5 27. The method of claim 26 wherein the monomer capable of forming the superabsorbent polymer is selected from the group consisting of acrylic acid, methacrylic acid, ethacrylic acid, α -chloroacrylic acid, α -cyanoacrylic acid, β -methylacrylic acid, α -phenylacrylic acid, β -acryloxypropionic acid, sorbic acid, α -chlorosorbic acid, angelic acid, cinnamic acid, p-chlorocinnamic acid, β -stearylacrylic acid, 10 itaconic acid, citraconic acid, mesaconic acid, glutaconic acid, aconitic acid, maleic acid, fumaric acid, tricarboxyethylene, maleic anhydride, vinyl sulfonic acid, allyl sulfonic acid, vinyl toluene sulfonic acid, styrene sulfonic acid, sulfoethyl acrylate, sulfoethyl methacrylate, sulfopropyl acrylate, sulfopropyl methacrylate, sulfopropyl acrylate, sulfopropyl methacrylate, 2-hydroxy-3-methacryloxypropyl sulfonic acid, 2-acrylamide-2-methylpropane sulfonic acid, and mixtures thereof.

15 28. The method of claim 26 wherein the superabsorbent polymer is selected from the group consisting of poly(acrylic acid), a hydrolyzed starch-acrylonitrile graft copolymers, a starch-acrylic acid graft copolymer, a saponified vinyl acetate-acrylic ester copolymer, a hydrolyzed acrylonitrile copolymer, a hydrolyzed acrylamide copolymer, an ethylene-maleic anhydride copolymer, an isobutylene-maleic anhydride copolymer, poly(vinylsulfonic acid), poly(vinylphosphonic acid), poly(vinylphosphoric acid), poly(vinylsulfuric acid), sulfonated polystyrene, a poly(vinylamine), a poly(dialkylaminoalkyl (meth)acrylamide), a lightly crosslinked polyethylenimine, a poly(allylamine), a poly(allylguanidine), a poly(dimethyldiallylammonium hydroxide), a quaternized polystyrene derivative, a guanidine-modified polystyrene, a quaternized poly((meth)acrylamide) or ester analog, and mixtures thereof.

25 30 29. The method of claim 26 wherein the neutralized superabsorbent polymer-clay particle in step (e) has a degree of neutralization of about 50 to about 80.